

IN THE CLAIMS

1. (Canceled) An electrical component package comprising a base to accommodate one or more electrical components on its surface and one or more coaxial vias formed in the base, wherein each of the coaxial vias and the base form a substantially flat surface for input/output of electrical signals from the electrical component.

5           2. (Canceled) The package of Claim 1, wherein each coaxial via further comprises a central conductive contact area surrounded by an insulating material ring such that the central conductive contact area, the insulating material ring around the central conductive contact area and the base form a coaxial via connection.

10           3. (Canceled) The package of Claim 2, further comprising one or more coaxial wires, each wire connecting a site on said component to one of the one or more coaxial vias.

            4. (Canceled) The package of Claim 3, wherein each of the one or more coaxial wires further comprises a conductive bonding wire, a conformal coating of insulating material that surrounds the conductive bonding wire and a conductive layer that coats the coating of insulating material to form a coaxial structure.

15           5. (Canceled) The package of Claim 4, wherein the one or more coaxial wires further comprise a tapered transition at the end of the coaxial wire connected to the coaxial via to enhance the coaxial characteristics of the coaxial wire.

            6. (Canceled) The package of Claim 5, wherein the tapered region further comprises an accumulation of conductive material where the coaxial wire connects to the coaxial via.

20           7. (Canceled) The package of Claim 6, wherein the tapered region further comprises a thicker coating of insulating material adjacent the tapered transition.

            8. (Canceled) The package of claim 1, wherein the base further comprises electrically conductive material.

25           9. (Canceled) The package of claim 1, wherein the base further comprises a thermally conductive material.

10. (Canceled) The package of claim 1, wherein the base further comprises a material having a thermal expansion coefficient that matches with thermal expansion coefficient of the one or more electrical components to be mounted on the base.

11. (Canceled) The package of claim 1, wherein the coaxial vias include a solder mask.

12. (Canceled) The package of claim 11, wherein the solder mask extend to the package edge.

13. (Canceled) A structure comprising an electrical device having at least one conductive pad, a base material to which the electrical device is mounted wherein the base has at least one coaxial via that forms a substantially flat surface with the base, and a micro-coaxial wire connecting said pad to a conductor in said coaxial via to provide a coaxial signal path from the electrical device to the coaxial via.

14. (Canceled) The structure of Claim 13, wherein each coaxial via further comprises a central conductive contact area surrounded by an insulating material ring such that the central conductive contact area, the insulating material ring around the central conductive contact area and the base form a coaxial via connection.

15. (Canceled) The structure of Claim 13, wherein each micro-coaxial wire further comprises a conductive bonding wire and a conformal coating of insulating material that surrounds the conductive bonding wire to form a coaxial structure.

16. (Canceled) The structure of Claim 15, wherein the micro-coaxial wires further comprise a tapered transition at the end of the coaxial wire connected to the coaxial via to enhance the coaxial characteristics of the micro-coaxial wire.

17. (Canceled) The structure of Claim 16, wherein the tapered transition further comprises an accumulation of conductive material where the coaxial wire connects to the coaxial via.

18. (Canceled) The structure of Claim 17, wherein the tapered transition further comprises a thicker coating of insulating material adjacent the tapered transition.

19. (Canceled) The structure of claim 13, wherein the base further comprises electrically conductive material.

20. (Canceled) The structure of claim 13, wherein the base further comprises a thermally conductive material.

5 21. (Canceled) The structure of claim 13, wherein the base further comprises a material having a thermal expansion coefficient that matches with thermal expansion coefficient of the one or more electrical components to be mounted on the base.

22. (Canceled) The structure of Claim 15 further comprising a conductive coating applied to the outside of the insulating material wherein said conductive coating is electrically  
10 attached to a shield side of said coaxial via.

23. (Canceled) A method of fabricating coaxial electrical interconnections between a component and a coaxial via, comprising:

placing a wire between said component and a conductive portion of a coaxial via;

conformally coating the wire and component with dielectric material; and

15 conformally coating the dielectric material with a conductive material to form coaxial wires between the component and the coaxial via.

24. (Canceled) The method of Claim 23 further comprises selectively removing portions of said dielectric material prior to the conductive material conformal coating.

25. (Canceled) A method of fabricating a base structure with coaxial vias,  
20 comprising:

selectively etching an insulating material attached to a flat surface; and

plating said etched insulating material with a conductive material to form a center conductor for a coaxial via structure.

26. (Canceled) The method of claim 25, wherein the insulating material comprises  
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27. (Canceled) The method of claim 26 further comprising glazing said insulating material layer.

28. (Canceled) The method of claim 25 further comprising applying an adhesive layer to secure the insulating material to the flat surface.

5 29. (Canceled) The method of claim 28, wherein applying the adhesive layer further comprises plating the adhesive layer with gold..

30. (Canceled) The method of claim 28, wherein applying the adhesive layer further comprises plating the adhesive layer with gold and then nickel.

31. (Canceled) A high frequency component package, comprising:  
10 a substantially flat base to accommodate one or more electrical components on its surface;

one or more via holes formed in the base to permit signals from the electrical components to pass through the base; and

wherein each via hole further comprises a central conductive contact area surrounded by  
15 an insulating material ring such that the central conductive contact area, the insulating material ring around the central conductive contact area and the base form a coaxial via connection.

32. (Canceled) A packaged high frequency device, comprising:

a substantially flat base having a high frequency device bonded on its surface, the high frequency device having a plurality of bonding pads;

20 one or more via holes formed in the base to permit signals from the electrical components to pass through the base, wherein each via hole further comprises a central conductive contact area surrounded by an insulating material ring such that the central conductive contact area, the insulating material ring around the central conductive contact area and the base form a coaxial via connection; and

25 one or more coaxial bonding wires that connect the bonding pads of the high frequency device to the one or more coaxial via holes in the base wherein each coaxial bonding wire further comprises a conductive bonding wire and a conformal coating of insulating material that

surrounds the conductive bonding wire so that the signals are carried by a coaxial structure from the device out through the base.

33. (Canceled) The structure of Claim 2 wherein the central conductive  
5 contact area having a first diameter is electrically coupled to a conductive layer having a second diameter larger than the first diameter, wherein the ratio of the first and second diameters depend on the desired impedance characteristic.

34. (Canceled) The structure of Claim 2 further comprising a conductive layer,  
10 the conductive layer electrically coupled to the central conductive contact area and a part of the insulating material ring that is adjacent to the central conductive contact area.

35. (New) An electrical component package comprising:  
an electrically conductive base having a coaxial via, the coaxial via including a center pin  
15 surrounded by an insulating ring such that the insulating ring electrically isolates the center pin from the rest of the base;

an electrical component mounted on a first surface of the base; and

a coaxial wire capable of connecting the electrical component to the base, wherein the  
coaxial wire includes a wire capable of electrically coupling the electrical component to the  
20 center pin, an insulation layer surrounding the wire, and an electrically conductive shield coating the insulation layer.

36. (New) The component package of Claim 35, wherein the insulation layer is  
continuously deposited on the wire, the base, and the electronic component.

37. (New) The component package of Claim 36, wherein the conductive shield is  
conformally deposited on the insulation layer.

38. (New) The component package of Claim 35 further comprising an opening in the insulation layer for exposing the base, wherein the deposited conductive shield fills the opening and becomes electrically coupled with the base.

39. (New) The component package of Claim 35, wherein the coaxial wire further comprises a tapered region at an end of the coaxial wire that is connected to the coaxial via to enhance the impedance matching characteristics between the coaxial wire and the coaxial via.

40. (New) The component package of Claim 39, wherein the tapered region further comprises an accumulation of conductive material where the coaxial wire connects to the coaxial via.

41. (New) The component package of Claim 39, further comprising a thicker coating of the insulation layer adjacent the tapered region.

42. (New) The component package of claim 35 further comprising a solder mask layer deposited on a second surface of the base for protecting the insulating ring and improving solderability of the second surface.

43. (New) The component package of claim 42, wherein the solder mask layer is deposited on the center pin and over a part of the surrounding insulating ring.

44. (New) The component package of claim 43, wherein the solder mask layer and the second surface form a substantially flat surface.

45. (New) The component package of claim 35, wherein the base further comprises a material that is thermally matched with the electrical component.

46. (New) A structure for packaging electrical components, the structure comprising:  
a base material having at least one coaxial via, the coaxial via including a center pin surrounded by an insulating ring such that the insulating ring electrically isolates the center pin from the rest of the base material; and

a micro-coaxial wire extending from the coaxial via, wherein the coaxial wire includes a wire, an insulation layer surrounding the wire, and an electrically conductive shield coating the

insulation layer, and wherein the wire is electrically coupled to the center pin and the conductive shield is electrically coupled to the base to form a coaxial connection.

47. (New) The structure of Claim 46, wherein the insulation layer is continuously deposited on the wire, the base, and the electronic component, further comprising an opening in the insulation layer for exposing the base.

48. (New) The structure of Claim 47, wherein the shield is conformally deposited on the insulation layer and becomes electrically coupled to the base by filling the opening, such that the shield, the insulation layer, and the wire form the coaxial wire.

49. (New) The structure of Claim 46, wherein the coaxial wire comprises a tapered region at an end of the coaxial wire connected to the coaxial via.

50. (New) The structure of Claim 49, wherein the tapered transition comprises an accumulation of conductive material where the coaxial wire connects to the coaxial via.

51. (New) The structure of claim 50, wherein the tapered transition further comprises a thicker coating of insulating material adjacent to the tapered region.

52. (New) The structure of claim 46, wherein the coaxial wire extends from a first surface of the base, further comprising a solder mask layer deposited on a second surface of the base and covering the center pin and a part of the insulating ring.

53. (New) The structure of claim 52, wherein the second surface of the base forms a substantially flat surface.

54. (New) The structure of claim 46, wherein the base further comprises a thermally conductive material.

55. (New) A method of fabricating coaxial electrical interconnections between a component and a coaxial via, wherein the coaxial via includes a conductive center and an insulating ring surrounding the conductive center, wherein both the conductive center and the insulating ring are formed in a conductive base, the method comprising:

electrically coupling a wire to the conductive center;

coating the wire, the conductive base, and the component with a dielectric material;

conformally depositing an electrically conductive material on the dielectric material; and  
coupling the electrically conductive material with the conductive base such that the wire,  
the dielectric material, and the electrically conductive material form a coaxial wire for  
connecting the component to the base and the conductive center.

5           56.   (New) The method of Claim 55, wherein coupling the electrically conductive  
material with the conductive base comprises selectively removing portions of said dielectric  
material prior to conformally depositing the electrically conductive material.

57.   (New) The method of Claim 55 further comprising tapering a portion of the wire  
that is nearest to the conductive center.

10          58.   (New) The method of Claim 57, wherein the tapering comprises forming a  
capillary ball.

59.   (New) The method of Claim 57, wherein the tapering comprises applying solder  
paste to an interface between the wire and the center pin.

15          60.   (New) The method of Claim 57 further comprising thickening the dielectric  
material surrounding the tapered portion of the wire.

61.   (New) A method of fabricating a base structure having a coaxial via, the method  
comprising:

providing a flat conductive base having a coaxial via formed therein, wherein the coaxial  
via includes a conductive center and an insulating ring for electrically separating the conductive  
20   center from the base;

electrically coupling a wire to the conductive center;

coating the wire and the base with an insulating material;

selectively etching the insulating material to expose a portion of the base; and

25   plating the wire and the etched insulating material with a conductive material to form a  
coaxial wire having an external conductive portion that is coupled to the base.



62. (New) An electrical device comprising:

an electrically conductive base having a coaxial via, the coaxial via including a center pin surrounded by an insulating ring such that the insulating ring electrically isolates the center pin from the rest of the base;

5 an electrical component mounted on a first surface of the base; and

a coaxial wire connecting the electrical component to the base, wherein the coaxial wire includes a wire for electrically coupling the electrical component to the center pin, an insulation layer surrounding the wire, and an electrically conductive shield coating the insulation layer, wherein the coaxial wire and the coaxial via maintain a substantially constant characteristic  
10 impedance connection from the electrical component to an outside connection point through the base.

63. (New) The device of Claim 62, wherein the insulation layer is continuously deposited on the wire, the base, and the electronic component.

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64. (New) The device of Claim 63, wherein the conductive shield is conformally deposited on the insulation layer that is covering the wire, the base, and the electronic component.

65. (New) The device of Claim 63 further comprising an opening in the insulation  
20 layer for exposing the base, wherein the conductive shield fills the opening and becomes electrically coupled with the base.

66. (New) The device of Claim 62, wherein the coaxial wire further comprises a tapered region at an end of the coaxial wire that is connected to the coaxial via to enhance the impedance matching characteristics between the coaxial wire and the coaxial via.

25 67. (New) The device of Claim 66, wherein the tapered region further comprises an accumulation of conductive material where the coaxial wire connects to the coaxial via.

68. (New) The device of Claim 66, further comprising a thicker coating of the insulation layer adjacent the tapered region.

69. (New) The device of claim 62 further comprising a solder mask layer deposited on a second surface of the base for protecting the insulating ring and improving solderability of the second surface.

70. (New) The device of claim 69, wherein the solder mask layer deposited on the second surface of the base is deposited on the center pin and over a part of the surrounding insulating ring.

71. (New) The device of claim 70, wherein the solder mask layer and the second surface are substantially flat.

72. (New) The device of claim 62, wherein the base further comprises a material that is thermally matched with the electrical component.

CONCLUSION


If the Examiner wishes to discuss any aspect of this application, the Examiner is invited to telephone Applicants' undersigned attorney at 650-833-2121.

5 Any fee due for this Amendment may be charged to Deposit Account No. 07-1896.

Respectfully submitted,

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Dated: 1/14, 2004

  
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